

Press Release

Universal bonding from Heraeus Kulzer exhibits excellent handling and mechanical properties

iBOND® Universal is convincing in various studies

Hanau, January 2016 – **Three different studies examined prominent properties of iBOND Universal, Heraeus Kulzer's latest bonding agent. A study from the University of Erlangen, Germany, on silicate ceramics attested iBOND Universal with the use of its Ceramic Primer to obtain greatest adhesion among the tested universal adhesives.¹ A study carried out at the University of Mainz, Germany, confirmed the low technique sensitivity of iBOND Universal: it showed bond strength at gold standard level.² Furthermore, the University of Marburg, Germany, examined iBOND Universal in terms of marginal quality and confirmed the good marginal quality in a study.³ On the whole, all three studies attest to the broad and reliable applicability of iBOND Universal.**

iBOND Universal offers prerequisites for long-lasting restorations

Longevity is an important requirement for indirect restorations, especially in view of the expenses. Basic conditions to ensure long-lasting restorations are, first of all, treatments within the proper indication area and a carefully selected suitable restorative material. Further key factors are preparation and a cementation process which includes the successful adhesion to the restoration. Following these is the necessity for satisfactory patient oral hygiene. As the adhesion occupies such a significant place in the restoration process, the study on the adhesive potential of iBOND Universal is all the more meaningful.¹ The aim of the study was to evaluate the adhesive potential of iBOND Universal to lithium disilicate ceramics compared to three other universal adhesives using a rope assisted tensile bond strength test. Lithium disilicate Cerec blocks were etched

with hydrofluoric acid. The adhesives were applied according to their instruction for use, which meant that the three competitor products were used without silane primer as described. Prior to the application of iBOND Universal, iBOND Ceramic Primer (silane) was applied to ceramic surfaces. All adhesives were light cured, the ceramics were luted with Variolink II and light cured. All specimens were stored in water for 24 hours and half of the specimens were later thermocycled. The tensile bond strength test documented that iBOND Universal exhibited the greatest adhesion potential among all tested materials on etched lithium disilicate substrates, both before and after thermocyclic loading. The authors concluded that universal adhesives should not generally be used as bonding agents for lithium disilicate ceramics without a silane. An additional silanisation step is recommended to assure higher long term bond strength of universal adhesives to lithium disilicate ceramics.¹

In light of the influence of the bonding agent on the longevity of the adhesive restoration, and the rather high number of application errors, state-of-the-art bondings should exhibit a reduced technique sensitivity. This is what the study from the University of Mainz set out to do by comparing the bond strength of iBOND Universal applied by inexperienced dental students to the adhesive gold standard after 24 hours and simulated ageing.² Twenty-eight undergraduate dental students from the University of Mainz applied the adhesives to flat bovine dentine surfaces according to their instruction for use. iBOND Universal was applied in accordance with the self-etch and etch & rinse technique and the 3-step adhesive Optibond FL was used in its etch & rinse technique. After light curing, a composite cylinder made from Venus Pearl was added and light cured. Shear bond strength was determined using the Ultradent method. Half of the specimens of each adhesive/bonding technique combination were tested after 24 hours of storage in water at 37°C. The other half was tested after additional 5000 cycles of thermocycling. The results demonstrate that iBOND Universal achieves bond strength values at the level of the 3-step gold standard adhesive, even after

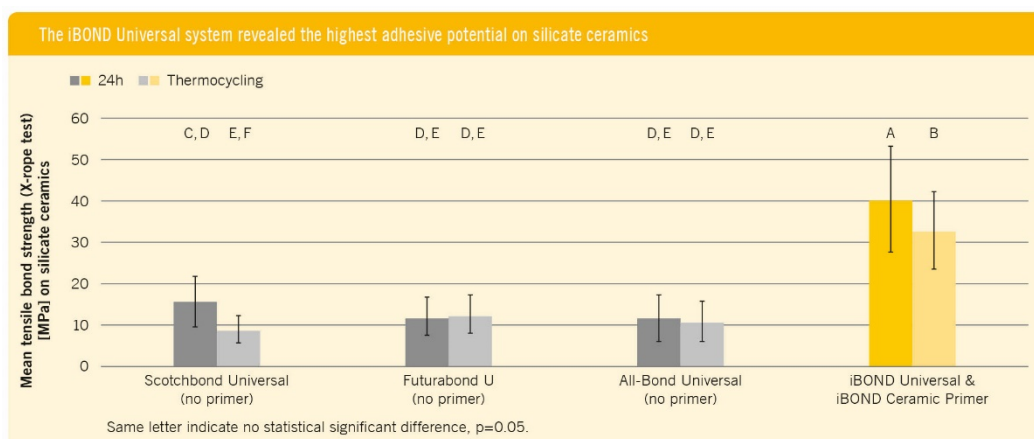
simulated ageing. Even inexperienced students were able to achieve high bond strength in both bonding techniques, confirming the low technique sensitivity in iBOND Universal.

Marginal staining is another factor that often leads to unnecessary restoration replacements, thus thwarting the desired longevity of a restoration. On the one hand the difference between discolouration and marginal caries is often difficult to identify, on the other hand patients feel unhappy with the aesthetic outcome. It is therefore beneficial to use restorative materials, such as adhesives and composites, which provide good marginal quality, even after simulated ageing. So, last but not least, scientists from the University of Marburg investigated the influence of the etching protocol on the marginal quality of three different universal adhesives, with and without thermomechanical loading.³ A total of 48 MOD cavities were prepared in extracted human third molars. Direct resin composite restorations with Venus Diamond were bonded with different adhesives in the self-etch and etch & rinse mode. The marginal gaps were analysed before and after the thermomechanical loading. The study results document the convincing marginal quality of iBOND Universal. They also show that iBOND Universal can be used in each bonding technique, as the results came out consistently, irrespective of the bonding technique used. The quality of enamel margins of all tested adhesives can be optimised by a preceding selective enamel etching step.

More information about Heraeus Kulzer

- Website with information on the company and products:
www.heraeus-kulzer.com
- YouTube channel with practical tips and tricks:
www.heraeus-kulzer.com/youtube
- Heraeus Kulzer Facebook page with the latest news from Heraeus Kulzer:
www.facebook.com/heraeuskulzer

- 1 Zorzin J, Wendler M, Belli R, Petschelt A, Lohbauer U: Tensile bond strength of universal adhesives to lithium disilicate ceramic. Poster presentation #P62 at the 23th European Dental Material Conference in Nuremberg, Germany, 27-28 August 2015.
- 2 Ehlers V, Ernst C-P, Kastrati A, Gerlach M, Eppinger R, Willershausen B: Bond strength comparison of a new universal adhesive to a gold-standard. J Dent Res 94 (Spec Iss B), 0544 CED, 2015, (<http://www.iadr.org>).
- 3 Frankenberger R, Hartmann VE, Krech M, Braun A, Roggendorf MJ: Marginal quality of iBOND Universal in self-etch and etch-and-rinse mode vs. Scotchbond Universal Bond. Test report 2015. Unpublished data. Data on file.



Source: Zorzin J, Wendler M, Belli R, Petschelt A, Lohbauer U: Tensile bond strength of universal adhesives to lithium disilicate ceramic. Poster presentation #P62 at the 23th European Dental Material Conference in Nuremberg, Germany, 27-28 August 2015.

About Heraeus Kulzer

Heraeus Kulzer GmbH is one of the world's leading dental companies with its headquarters in Hanau, Germany. As a trusted partner, the company supplies dentists and dental technicians with an extensive product range, covering cosmetic dentistry, tooth preservation, prosthetics, periodontology and digital dentistry. More than 1,500 employees at 26 locations worldwide are driven by their expertise and passion for the dental market and embody what the name Heraeus Kulzer stands for: service, quality and innovation.

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Heraeus Kulzer has been part of the Japanese Mitsui Chemicals Group since July 2013. Mitsui Chemicals, Inc. (MCI) is based in Tokyo, and has 137 affiliates with more than 14,300 employees in 27 countries worldwide. Its innovative, practical chemical products are as much in demand in the automotive, electronics and packaging industries as they are in other fields such as environmental protection and healthcare.

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